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## **2015 Decompression Sickness/Extravehicular Activity Risks Standing Review Panel Status Review**

### **Status Review for:**

*The Risk of Decompression Sickness and  
The Risk of Injury and Compromised Performance Due to EVA Operation*

### **Comments to the Human Research Program, Chief Scientist**

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2015 Decompression Sickness/Extravehicular Activity (DCS/EVA) Risks Standing Review Panel (SRP) Status Review WebEx/teleconference Participants:

#### **SRP Members:**

David Klaus, Ph.D. – University of Colorado, Boulder  
Richard Mahon, M.D. (chair) – Naval Medical Research Center (retired)  
Tom Neuman, M.D. – University of California, San Diego (Emeritus)  
Andrew Pilmanis, Ph.D.  
David Regis, M.D. – US Navy Exchange Diving Medical Officer to the UK Institute of Naval Medicine

#### **NASA Glenn Research Center (GRC):**

Maria Havenhill

#### **NASA Johnson Space Center (JSC):**

Yael Barr, M.D.  
Omar Bekdash  
Johnny Conkin, Ph.D.  
Joseph Dervay, M.D.  
Jennifer Fogarty, Ph.D.  
Kerry George  
Jill Klein  
Jason Norcross  
Peter Norsk, M.D.  
Stephanne Ploeger  
Gary Riccio, Ph.D.  
Robert Sanders  
Mark Shelhamer, Sc.D.  
Susan Steinberg, Ph.D.  
Jennifer Tuxhorn, Ph.D.  
Jennifer Villarreal  
Jim Wessel

#### **NASA Headquarters (HQ):**

Bruce Hather, Ph.D.

#### **NASA Research and Education Support Services (NRESS):**

Tiffin Ross-Shepard

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On November 2, 2015, the DCS/EVA Risks SRP, participants from the JSC, GRC, HQ, and NRESS participated in a WebEx/teleconference. The purpose of the call (as stated in the Statement of Task) was to allow the SRP members to:

1. Receive an update by the HRP Chief Scientist (or designee) on the status of NASA's current and future exploration plans and the impact these will have on the HRP.
2. Receive an update on any changes within the HRP since the 2014 SRP meeting.
3. Receive an update by the Element or Project Scientist(s) since the 2014 SRP meeting.
4. Participate in a discussion with the HRP Chief Scientist (or designee) and the Element regarding possible topics to be addressed at the next SRP meeting.

Based on the presentations and the discussion during the WebEx/teleconference, the SRP would like to relay the following information to Dr. Shelhamer, the HRP Chief Scientist.

1. The SRP would like to compliment and thank Jason Norcross for a very thorough update on the changes to the DCS and EVA research plans since our meeting last year.
2. Overall the SRP thinks the DCS and EVA Risks are addressing the right gaps with the appropriate tasks.
3. During the "Risk of Injury and Compromised Performance due to EVA Operations" presentation, it was not clear that the suits were pressurized to 4.3 per square inch differential (psid) in the tests. To avoid confusion, it would be helpful to clearly state the test conditions in future SRP presentations.
4. During and after the SRP teleconference, there was considerable conversation regarding the exploration atmosphere of 8.2/34%. The SRP is currently satisfied with the explanation of leaving the exploration atmosphere at 8.2/34%, but would like to request an update next year on the Hypoxia Review, as well as the research protocol for the validation.
5. The SRP wants to make sure that the Human Health Countermeasures (HHC) Element is considering the following; with all of the multiple factors affecting the astronauts (radiation exposure, microgravity, hypobaric and hypoxic environment, decompression stress, etc.) long term bone health will most likely be an issue and while dysbaric osteonecrosis is not as common among aviators/hypobaric exposures, the combination of these exposures could reveal some issues especially with the real risk of bone density loss. The SRP suggests addressing this by longitudinally following current astronauts and possibly performing some animal studies.